PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: NEAL et al.

Application No.: 09/741,958

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Title: PRICE OPTIMIZATION SYSTEM

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Signed: Sue Funchess
Sue Funchess

PETITION TO MAKE SPECIAL
UNDER 37 C.F.R. § 1.102 AND MPEP ¶ 708.02(viii)

Commissioner for Patents
Washington, D.C. 20231

Sir:

In accordance with the provisions of 37 C.F.R. § 1.102 and M.P.E.P. ¶ 708.02(viii), Applicants respectfully petition to make special the above-identified application so that examination is accelerated. The required fee of $130.00 is submitted herewith.

The Applicants elect claims 6-13 without traverse. Applicants respectfully submit that the elected claims are drawn to a single invention. In addition, if the Office determines that the elected claims are not obviously drawn to a single invention, Applicants will make an election without traverse.

As a basis for granting this petition, the following statements and discussion are offered.

Preexamination Search

A search of the prior art was conducted by a professional searcher at the request of Applicant. The search was conducted in Class 705, subclass 1 and Class 7, subclasses 10, and 400.

The patents found by the search are listed below:

U.S. Patent No.	Inventor(s)
6,094,641	Ouimet et al.
6,078,893	Ouimet et al.
5,987,425	Hartman et al.
5,878,400	Carter
5,873,069	Reuhl et al.
5,822,736	Hartman et al.
5,377,095	Maeda et al.
5,117,354	Long et al.
6,032,125	Ando
6,009,407	Garg
5,712,985	Lee et al.

6,125,355	Bekaert et al.
6,032,123	Jameson
6,029,139	Cunningham et al.
5,918,209	Campbell et al.
5,249,120	Foley
5,063,506	Brockwell et al.

A copy of each of these patents has already been submitted to the Patent Office in an Information Disclosure Statement filed March 9, 2001 and is therefore not submitted herewith. None of the patents located during the search disclose Applicants' claimed invention.

References 1-8 listed above teach systems for price optimization or item pricing comprising a demand/market model, rules parameters and/or an expert system. References 9-11 disclose demand forecasting models. The remaining references 12-17 disclose asset, promotion, or margin optimization, or costing and resource pricing optimization.

As amended by a Preliminary Amendment filed herewith, Claims 6-13 recite, either directly or indirectly, an "apparatus for computing a preferred set of prices for a plurality of products, comprising: an econometric engine for modeling sales as a function of price to create a sales model based on Bayesian modeling; a financial model engine for modeling costs to create a cost model; and an optimization engine ... to receive input from the econometric engine and financial model engine ... generates the preferred set of prices."

A number of advantages over prior art systems are realized in accordance with the present invention. One advantage results from the fact that the invention includes an "econometric engine for modeling sales as a function of price to create a sales model based on Bayesian modeling" as recited by Claim 6. In the described embodiment, the "econometric

modeling engine relies on a mixed-model framework, ... mixed model methodology is also referred to as 'Bayesian Shrinkage' Modeling, because by combining data from various stores and/or products, one can 'shrink' individual parameter estimates towards the average estimate, dampening the extreme values that would result if traditional regression were used." (Specification at page 60, line 15 to page 61, line 3)

In addition, claim 11 recites "wherein the plurality of products is divided into a plurality of demand groups" which are groups of highly substitutable products (Specification at page 17, lines 2-3). "The invention also advantageously determines "an equivalizing factor ... to facilitate comparisons between different size products in a demand group (specification at page 18, lines 15-16). This technique can be used to reliably predict demand of related similar goods and/or new goods using minimal data regardless of sizes of goods.

None of the references found in Applicants' pre-examination search teach or suggest an "econometric engine for modeling sales as a function of price to create a sales model based on Bayesian modeling; ... and an optimization engine ... to receive input from the econometric engine and financial model engine ... generates the preferred set of prices." (Claim 6).

In the following discussion, only independent Claim 6 is discussed. Dependent claims 7-13 are allowable over the cited art for at least the reasons given with respect to claims from which the dependent claims depend.

Ouimet '641

Ouimet '641 teaches a "method for incorporating psychological effects into a demand model for pricing. First, the original demand model is modified to include a mechanism to convert actual prices into perceived prices, thus causing the demand model to predict higher demand for certain prices. The user specifies the function that converts from real prices perceived prices. This modified demand function is then fitted to a sales history to yield the parameters appropriate to its particular form. Also, the demand model can be modified to account for promotional effects. The user defines a visibility model, which gives the relative increase in demand for an item caused by a promotion and the cost of the promotion. The demand model is modified to include the effect of increased demand based on the visibility, and a profit model is modified to account for the added cost due to the added visibility. The profit model is then optimized with respect to both prices and promotions." (Abstract)

In a preferred embodiment of Ouimet '641, as illustrated by Figures 4A and 4B, the user selects from a menu, a demand model for predicting sales, a perceived pricing model for predicting perceived prices, and a visibility cost model which measures the change in demand of

an item due to various levels of promotion of the item. An example of the output is provided in Figure 12 and includes a list of items, an optimal price for each item, and an optimal level of visibility for each item. (Col. 4, line 25 to Col. 6, line 26)

Thus Ouimet '641 does not disclose the claimed invention, and independent Claim 6 is allowable over Ouimet '641. Dependent Claims 7-13 are also allowable over Ouimet '641 for at least the same reasons.

Ouimet '893

Ouimet '893 teaches a "method for tuning a demand model in manner that is stable with respect to fluctuations in the sales history used for the tuning is provided. A market model is selected, which predicts how a subset of the parameters in the demand model depends upon information external to the sales history; this model may itself have a number of parameters. An effective figure-of-merit function is defined, consisting of a standard figure-of-merit function based upon the demand model and sales history, plus a function that attains a minimum value when the parameters of the demand model are closest to the predictions of the market model. This effective figure-of-merit function is minimized with respect to the demand model and market model parameters. The resulting demand model parameters conform to the portions of the sales history data that show a strong trend, and conform to the external market information when the corresponding portions of the sales history data show noise." (Abstract)

As illustrated by Figures 4-6, Ouimet '893 discloses a user selecting a consumer demand model to be tuned to the sale data. Next, the user selects a market model, which describes how some parameters of the demand model are expected to behave according to external market information. Finally, the user enters a figure-of merit function that depends upon the selected demand model. The stabilized tuning of the selected consumer demand model is then performed. The parameters that minimize the effective figure-of-merit function are then determined. The market function stabilizes the tuning process by incorporating information external to the sales history. (Col. 4, line 40 to Col. 5, line 33)

Ouimet '893 does not teach or disclose an "econometric engine for modeling sales as a function of price to create a sales model based on Bayesian modeling". Thus Claim 6 and dependent claims 7-13 are allowable over Ouimet '893.

Hartman '425

Hartman '425 teaches a variable margin pricing system for generating retail prices based on customer price sensitivity. Products are grouped into pools from a first pool for most price

sensitive products to a last pool for least sensitive products. A logical relationship between margins and the customer price sensitivity is determined for the products. Based on this logical relationship and each product's pool assignment, the system calculates each product's variable margin, retrieves its product cost and then generates a corresponding retail price. (Abstract and Figure 5)

In particular, Hartman '425 does not teach nor suggest an "econometric engine for modeling sales as a function of price to create a sales model based on Bayesian modeling". Claim 6 and its dependent claims are therefore allowable over Hartman '425.

Thus Hartman '425 does not disclose the claimed invention, and independent Claim 6 and dependent Claims 7-13 are allowable over Hartman '425.

Carter

Carter discloses a method and apparatus for determining prices for various products offered to various purchasing organizations. An organizational hierarchy of organizational groups is created, where each group represents a characteristic of the organizational groups. One or more customers (i.e., purchasing organizations) may be members of each organizational group and each customer may be a member of more than one organizational group. When a customer is selected, all of the groups to which that customer belongs, and all the pricing adjustments for which each is eligible, are identified. This permits pricing rules to be based on characteristics of each organizational group instead of basing the rules on individual customers.

A similar product group hierarchy is also created. Pricing adjustments for a particular product are determined by retrieving the price adjustments for that particular product as well as the price adjustments for product groups above the particular product in the product group hierarchy. The various pricing adjustments applicable to a particular product offered to a particular purchasing group are sorted, based on several criteria, to arrive at a final price. (Col. 3, line 21 to Col. 4, line 11)

Carter does not disclose the claimed invention as recited by independent Claim 6. Hence claims 6-13 are allowable over Carter.

Reuhl

Reuhl teaches an automated system for a seller or merchant to manage complex pricing standards for a plurality of goods or services, but also provides a buyer at the point of sale with price comparisons among competitors to ascertain the best price available for a product or a substantially similar product. Specifically, the price-changing function of the system is

responsive to competitive price data on identical or substantially similar products in multiple geographic markets for multiple competitors. The database includes indicia for each item sold, including a product identification number, the market in which it is sold, the price, value added characteristic, special financing arrangements or premium offered, and market type which related to profit margin. The pricing software defines an active price for every item, the active price, an advertised price for specials, a sale price, and competitors' prices for the identical or substantially similar item.

The system includes a sales subsystem, a merchandising subsystem and a marketing subsystem. The sales subsystem processes sales information such as pricing data and displays a comparative price set of updated pricing data and competitors' prices for a selected market to a buyer at a point of sale. The merchandising subsystem processes merchandising information including updated pricing data, maintains and updates information on competitor's shopped prices and advertised prices, and determines the user's advertisement response price responsive to competitor's advertised prices. The marketing subsystem processes marketing information such as updated pricing data, creates, stores and maintains information on user's and competitor's products. In addition, the system creates, stores and maintains competitor's derivative models, i.e., models substantially similar to a product sold by the user. (Col. 3, line 5 to Col. 4, line 48)

Ruehl does not disclose the claimed invention as recited by independent Claim 6, and hence claims 6-13 are allowable.

Hartman '736

Hartman '736 discloses a variable margin pricing system that generates retail prices based on customer price sensitivity. Products are grouped into pools from a first pool for most price sensitive products. A logical relationship between gross profit margins and the customer price sensitivity is determined for the products. Based on this logical relationship and each product's pool assignment, the system assigns each product's varying margin. Retail prices for each of the products are then generated, as determined by the cost information and the assigned margins for each of the corresponding products. Alternatively, retail price labels having retail prices based on customer price sensitivity and cost of the product to which the price labels are to be affixed or located proximate. (Abstract and Col. 1, line 66 to Col. 2, line 18)

Claims 6-13 are all allowable because Hartman '736 does not disclose the claimed invention.

Maeda

In Maeda, a merchandise analysis system predicts the sale of a registered item. The system includes a sales data table having sales data of a plurality of items, an input terminal for registering an item and for setting an analysis term, a retrieval unit connected to the table and the input terminal for searching the sales data table for the sales data corresponding to the registered item and the analysis term. In addition, the system includes a functional table with various functions fitted to respective data of sales versus price, and a dispersion measure table for storing errors obtained with respect to the respective data of sales versus price retrieved on the basis of the respective functions. An analysis device connected to the dispersion measure table obtains errors with respect to all retrieved data on the basis of the predicted sales data based on a selected function and the actual sales data to thereby obtain the minimum error with respect to all the functions and to the function parameters to minimize the error. The system also includes a table for registering the minimum error corresponding to the function having the function parameters with respect to all the functions.

Maeda teaches obtaining the predicted sale on the basis of the selected function and the set price inputted correspondingly to the display. The standard deviation of errors is obtained on the basis of errors with respect to all the retrieved data obtained on the basis of the predicted sales based on the selected functions and the actual sale. (Abstract and Col. 1, line 30 to Col. 2, line 18)

Maeda does not teach the invention as recited by claim 6 and hence claims 6-13 are all allowable.

Long

Long discloses an automated pricing and order entry of custom manufactured parts for the air handling equipment industry. The system assists sales representatives in the creation of product identification codes, providing the specifications of the product to be made. Completed orders of such items are deposited in an email system addressed to the manufacturer. The manufacturer's host computer periodically pools the email system for communications and then either prices the quote or processes the order. Hence, the system provides efficient pricing and ordering for the manufacture of air distribution equipment in a prompt and expeditious manner while lowering the probability of erroneous price quotes and incorrect ordering errors. (Abstract and Col. 2, line 36 to Col. 3, line 6)

Long does not disclose the claimed invention. As such, claims 6-13 are all allowable.

Ando

Ando provides a system for forecasting the demand agreeing with the fluctuation trend of sales results at high and stable precision, without requiring user's maintenance, by using a model optimized for grasping the fluctuation trend of sales results, even if the products are diverse, by storing a plurality of models of neural networks. Examples include a model for forecasting the demand from data of the same period of the previous year and a model for forecasting the demand from both the latest data and data of the same period of the previous year, and also by feeding sales results into a model of the neural network to make it learn by a short period, such as by the week, and a recording medium in which is recorded such a program.

The model incorporates the position data indicating its position on the calendar, such as which week of the year, as a processing element, and this position data is fed into the neural network together with the sales results. As a result, it is not necessary to secure a tremendous amount of data for analyzing the fluctuation trend of sales results. Old data which can hinders the grasping of fluctuation trend of the sales results is eliminated from the data for demand forecasting and high precision of demand forecasting is obtained. (Abstract, Figure 3, and Col. 1, line 65 to Col. 3, line 8)

Ando does not disclose the claimed invention as recited by claim 6. Claim 6 and dependent claims 7-13 are allowable over Ando.

Garg

Garg discloses a computer-implemented method for merging product marketing control and product inventory control, generates a segment-level consumer choice model for a plurality of competing brands and aggregates that to a market-level consumer choice model, and then generates a brand-level demand probability distribution function based on the choice models. A cost-minimized base stock level and a demand forecast for each of the plurality of brands is generated based on the market-level model, consumer choice model and on the pricing, promotion, and other marketing data for each of the brands. An inventory control receives inventory subtraction data and inventory addition data and, using the cost-minimized base stock levels, generates orders to replenish the inventory.

The system models a firm in a competitive market comprising several firms selling products within a category. A firm in this market could sell one or more brands of products within this category. Each customer in this market belongs to one of the several segments based on his/her purchasing behavior. Firms employ different promotional and pricing strategies for the brands they sell.

The market condition sensor gathers information about the product market, the information including competitor strategies and other facts having known effect on the market. A consumer segmentation module received the brand promotion and pricing database as well as information from point of sale (POS) sensors. The marker-level brand sales sensor provides information about brand sales of each brand in the market for estimating accurate market share for each brand, allowing a sales forecast for the firms' own brand. (Abstract and Col. 2, line 38 to Col. 4, line 30)

Garg does not teach the recited claim 6 and hence claims 6-13 are allowable.

Lee

Lee teaches a demand forecasting and production scheduling system which creates production schedules for various business items describing a forecasted demand for the business items in a number of future time intervals. The system includes a profile database, including a base profile for each business item, and a number of influence profiles. The profiles describe variations in demand for the business item in a number of time intervals. The base profile describes an underlying level of demand for a business item that is anticipated for the business item absent any influencing factors, such as promotional sales, holidays, weather variations, and the like.

The variations in demand for the business item due to such influence factors are stored in the data set as influence profiles, and may be either standard, percentage, or seasonal. The forecasted demand for a business item in a number of future time intervals is determined by selective combination of the base profile for the business item and any number of influence profiles. A production schedule is created and actual demand for the business item is monitored and stored. The variations between the actual demand and forecasted demand are used to update the base and influence profiles. The forecasted demand is recomputed and the production schedule updated accordingly. (Abstract)

Lee does not disclose the claimed invention as recited by claim 6. Thus claims 6-13 are all allowable over Lee.

Bekaert

Bekaert discloses a pricing module for modeling both fixed-income securities and equity securities into the future in an arbitraged-free model. The model is based on common input state variables and does not allow arbitrage conditions between the fixed-income securities and the equity securities as well as no arbitrage within a security class.

In one embodiment, fixed-income security pricing is based on an inflation value, a real rate value and a term structure risk parameter value. Equity security pricing is based on the inflation value, the real rate value, the term structure risk parameter value, a dividend growth value, and an equity correlation parameter. (Abstract and Col. 1, line 65 to Col. 2, line 6)

Bekaert does not suggest nor teach the claimed invention. Hence claims 6-13 are all allowable over Bekaert.

Jameson

Jameson teaches the allocation of all types of resources for commercial, governmental, or non-profit organizations, and the pricing of such resources. A linear programming process makes fulfillment allocations used to produce product units. A resource-conduit process governs the linear programming process, uses two-sided shadow prices, and makes aperture allocations to allow potential-demand to become realized-demand. A strict opportunity cost perspective is employed, and the cost of buyable resources is deemed to be the opportunity cost of tying up cash. Resource available quantities, product resource requirements, and potential-demand as a statistical distribution are specified in a database.

The database is used in the generation and storage of optimized allocation directives, resource marginal (incremental) values, and product marginal costs. This database can be viewed and edited via a graphical user interface. Monte Carlo simulations, along with generation of supply and demand schedules, is included to facilitate analysis, explore possible scenarios, and interact with the user to develop product offering, product pricing, and resource allocation strategies and tactics. (Abstract)

Jameson does not teach the claimed invention. As such, claims 6-13 are all allowable.

Cunningham

Cunningham teaches a system for optimizing the promotional sale of a product, a product segment, or a category while taking into account related products or competing products. The system includes an estimation component, an evaluation component and an optimization component, and uses segmentation rules. The system generates and populates a three-dimensional data structure corresponding to the sale history for a product. The data structure dimension corresponds to an event type domain, a time domain, and a unit of measurement domain. A neural network is trained and sales objectives and constraints are applied to the neural network. Using product information and product history, the system proposes a promotional plan that better meets a user's goals. (Abstract, Figure 2 and Col. 1, line 59 to Col.

2, line 8)

Cunningham does not disclose claim 6. As such claims 6-13 are allowable over Cunningham.

Campbell

Campbell discloses a perishable resource revenue management system for determining marginal values for perishable resources expiring at a future time, for example, an airline seat, a hotel room night, rental car day or the like. Data for the perishable resources and composite resources is loaded from the management system into a marginal value system. Internal data structures are constructed for linking each of the perishable resources to their associated composite resources and for linking each of the composite resources to the associated perishable resources. The marginal values for the perishable resources are determined using a continuous optimization function using interdependencies among the perishable resources and the composite resources in the internal data structures. The marginal values from the marginal value system are stored in the management system. (Abstract)

Campbell does not disclose the invention as recited by claim 6, and hence claim 6-13 are all allowable.

Foley

Foley discloses an automated manufacturing cost estimating system with indirect cost allocation identifying a material in an initial state for manufacturing a product in a final state. The system defines an operation for converting the material from its initial state into the final state of the product, calculates the direct labor cost for each operation based on direct label hours, and calculates the indirect cost specifically allocated for each operation based on consumption of overhead cost elements by the operation. The cost of each operation is summed to determine the total manufacturing cost of a part.

A cost analyzing system utilizes the cost estimates by identifying a plurality of different materials in an initial state for manufacturing a product in a final state and defining a number of manufacturing operations for converting each of the different materials from its initial state into the final state of the product. A plurality of paths is generated through the interconnected operations between the different materials in the initial state and the product in a final state. The system then determines a predetermined cost parameter associated with each operation and accumulates the determined cost parameters along each path. (Abstract)

Foley does not teach the claimed invention. Thus claims 6-13 are all allowable.

Brockwell

In Brockwell, a cost estimation system estimates the cost of supplying parts to a manufacturing facility. The system comprises a first database for storing cost information for various supply methods including air freight, ocean freight, land freight, warehouse storage, plant storage and material handling costs. A user selects a supply method for the parts, and has the option of selecting a percentage of one type of transportation and a percentage of an alternate type of transportation to serve a backup. The user enters delivery frequency data indicating one or more frequencies of delivery to base a cost estimation. The system then estimates the cost of supplying the parts at the one or more frequencies of delivery and the selected supply methods. Finally, the cost estimates are presented to the user. (Abstract)

Brockwell does not teach the claimed invention as recited by Claim 6, and hence Claim 6 and Dependent Claims 7-13 are all allowable over Brockwell.

Conclusion

Applicants respectfully submit that the prior art found by the pre-examination search does not preclude the patentability of the claimed invention. For the reasons disclosed above, Applicants submit that the invention disclosed and claimed is novel and non-obvious in light of the prior art. Therefore, Applicants submit that this Petition to Make Special should be granted and early action on the Application is in order. The Examiner is urged to contact the Applicants' undersigned attorney at (831) 655-2300 if any questions remain.

Respectfully submitted,

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